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excellent. The main portion of the book is divided into three parts, treating of the insects affecting food crops, forest trees, and fruit crops, respectively. To this is appended a list of the insects discussed, an introduction to entomology, and a glossary of entomological terms. Much has been added, in the author's usual careful and thorough-going style, to the accounts of the first edition, published in 1881. The work will doubtless prove of great value to British agriculturists, and Miss Ormerod is to be congratulated upon its appearance.—C. M. W.

**Beetle Parasites.**—The braconid parasite of *Lixus concavus*, mentioned on page 972 of last month's NATURALIST, has been identified by Dr. C. V. Riley as *Bracon rugator* Say. I am also indebted to the same authority for determining the parasite of *Tyloderma foveolatum*, mentioned in the same connection, as *Bracon xanthostigma* Cresson.—C. M. W.

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#### ARCHÆOLOGY AND ETHNOLOGY.

**Rigveda Studies.**—Sanskrit students who have had an insight into Vedic studies know perfectly well that we are only at the beginning as far as a real comprehension of the Rigveda is concerned. In recent years many ripe scholars have striven to render this work more accessible. The joint work of two Halle professors, R. Pischel and K. F. Geldner, entitled "Vedische Studien," marks a great advance in this direction,<sup>1</sup> and intends to refute many erroneous ideas still adhered to concerning that oldest Aryan monument. The treatment of the mythologic element was undertaken by Pischel, whereas linguistics and text-criticism fell to the share of his collaborator.

Both are of the opinion that it is entirely wrong to consider the period when the Vedas, especially the Rigveda, took their origin as a pastoral or nomadic one, undefiled by the civilization or corruption which are characteristic of later historical epochs. The people were then as eager to acquire worldly goods as they ever were in the time of the classical epics called Maha-Bhârata and Ramâyana. They prized artistic ornaments and fine dwellings, knew the art of writing, and were acquainted with the use of salt. The mention of village communities and of walled towns or cities proves that the nomadic

<sup>1</sup> Vedische Studien von Richard Pischel und Karl F. Geldner. I. Bd., Stuttgart, Kohlhammer, 1889, 8vo, 33 and 328 pages.

period had come to an end long before. The wide diffusion of the custom of hetairism could prove by itself alone that the Vedic hymns, in which it is mentioned, are of a relatively late period.

Though the volume is mainly addressed to critical and philological specialists, many points in Pischel's remarks will be of use to every one interested in literary history,—the following for instance :

No one, says he, should start out upon Vedic studies before having laid a firm foundation for these by the perusal of the classical masterpieces, and for a better understanding of the Veda even Pâli and Prâkrit are indispensable. Mythologic comparisons taken from non-Aryan or from other Aryan nations are of very limited use, on account of the difference in time, manners, and ideas. They are likely to lead to very erroneous conclusions. The old Aryan religion, representing powers of nature and centering in Varuna, was on the wane in the Rigveda period ; Sûrya, Parjânya, are still in vogue, but a new and purely national religion, with Indra as its central figure, was just coming into ascendancy, and even then was more popular, because more thoroughly national and Hindooic, than the Varuna deities. Therefore we cannot expect to find in every god, myth, or folk-tale in the Rigveda a reminiscence of some Aryan god or idea, but have to compare as well the myths of modern India for their Indra folk-lore. Here the natural powers have given way entirely to human feelings and popular humor. The Agni and Soma hymns, with their stiff, mystic, formal, and priestly poetry, are generally superseded by the Indra hymns, with their lively imagination and humoristic vein.—A. S. G.

**Schliemann's Iliou.**—Those who suppose that the modern Trojan war—that is, the fiery contest between Schliemann and Captain Boetticher—has come to an end are entirely mistaken. Hector-Schliemann is defending his Pergamos as valiantly as ever, though Achilles-Boetticher is invoking all the help he can get from the gods to storm the citadel. In 1889 Schliemann invited Boetticher, with Virchow, Dörpfeld, and other competent men to visit the place personally, and the ruins were viewed on the spot. The report made on Schliemann's side claimed that at the time all difficulties had been settled, for Boetticher had declared that mistakes had been made on his part. Boetticher claims that the ruins, with the seven "cities" superposed to each other, were not cities, but huge cremation places surrounded by walls. Schliemann and Dörpfeld believe that only the third "city" (counted from below) was a crematory with urns. Boetticher believes that the huge *pithoi* or vats of pottery, often twelve feet high, were used for slow cremation of whole bodies of persons.

This Prof. Virchow denies, for notwithstanding the porosity of such vases, it was impossible to establish a draft sufficient for cremation. The most convincing argument of Boetticher for his theory is the smallness of the ruins, for they measure only one hundred and forty metres in length, and about ninety-three metres across,—a space upon which it was impossible to build a city one-tenth the magnitude of Homer's Troy. Boetticher has also demonstrated that at Hissarlik, where the ruins are, no hill ever existed before the first necropolis had gone there into ruins and began to form the mound now in existence. He locates the true city of Ilios upon the heights between Hissarlik and the Rhoeteion, a hill on the southern shore of the Dardanelles.

Before us is a series of five *missives* published by Boetticher after the return from Hissarlik, two of which are illustrated and quite voluminous (one being in French). The author claims to have been unfairly treated at that interview,—that the time set was too short for the purpose, and that he was not allowed to speak freely. So he maintains his former position firmly, and vigorously asserts his claim that the ruins in question are nothing but a necropolis to incinerate bodies after the Assyro-Babylonian fashion. Among the scientists who have given their assent to Boetticher's idea may be named Prof. Moritz Wagner, of Munich; Georg Ebers, of Leipzig; and C. de Harlez, of Louvain. This is said to those readers who rely upon scientific authorities.—A. S. GATSCHET.

**Additional Studies of Zuni Songs and Rituals with the Phonograph.**—I have already, in a previous number of the *NATURALIST*, mentioned some of the records of Zuni songs and rituals which were obtained during the last summer by means of the phonograph. Since the preparation of that paper I have been able to obtain several important additional records, and to revise some of those which were mentioned in my previous notice. Some of these are so important that a mention of them may interest those who are in sympathy with this method of research.

The difficulties in the transportation of the phonograph from the railroad to Zuni are not as great as might be imagined. Although the trail from Gallup, New Mexico, to Zuni Pueblo is in places very rough, the instrument suffered no damage from transportation. I found it convenient, however, to take with me the treadle machine, which is more practical for this kind of work than that furnished with the storage battery. The former is, moreover, more bulky, and on that account more difficult to carry over rough roads.

I have been repeatedly asked since my return, "What the Indians

thought of the phonograph?" That question can only be in part answered. What they really thought is unknown to me, but some of their remarks about it were rather interesting. Some of those who gave me songs declared that there was a person hidden in the machine who repeated what they sang; others said that the machine was bewitched. But not one of those whom I asked, except some squaws, seemed afraid of the instrument, or if they were afraid did not manifest it in any way. A Laguna Indian, who was a visitor in Zuñi at the time of my visit, philosophically remarked, as translated for me, that the white men used many machines which he did not understand, and as he knew these were not bewitched there was no reason to suppose that the phonograph was possessed of any such powers. I cannot, however, but think that all who saw the instrument mentally reiterated what the Zuñi silversmith, Kuishte, said to me in Spanish (perhaps not the purest Castalian), "*Melicano sabe mucho.*" I permitted them to hear the records which they had given, and in every case to my question whether the record was accurate or not they responded with that universal Zuñi word to which so many different shades of meaning are given by inflection, *kokshi*, good.

It was my good fortune to witness in Zuñi, in August of the present year, an ancient dance of interesting character. This ceremonial is a corn dance, and is known among the Zuñians as the *Otonarweh*. The ancient name is *Hamponey*. This dance is rarely performed, and has seldom been witnessed by white men, as it occurs only after intervals of several years. The *Hamponey* is reputed by all to be most ancient, and there are many ceremonies in it which indicate its antiquity. It was therefore with great interest that I made elaborate notes upon it, and sought particularly to obtain records of its songs on the cylinders of the phonograph for preservation. Through the kindness of one of the Indians, who occupied an important office in the ceremony, I was reasonably successful with the latter. When one considers the changes which yearly come to the Indians, and the probability that in a few years many of their customs will be greatly modified or disappear forever, the necessity for immediate preservation of their songs and rituals is imperative. In the case of the *Hamponey*, which is celebrated only once in from five to eight years, the necessity of preservation by observers is increased in proportion to the rarity of its occurrence. Eight years in the life of a New Mexican Pueblo may profoundly affect its whole social and religious characters; and when once lost these religious rites and ceremonials, which are survivals of the ancient indigenous culture of the southwestern territories of the United States, are lost forever.

It is my purpose later to publish an elaborate paper on the *Hamponey*, in which will be embodied the songs, set to music, which were obtained by the use of the phonograph, so that it is not necessary to do more in this account than to say that the ceremony is a corn dance performed by women, and somewhat similar to a dance called the *Klāheywey*, yearly celebrated by them. It is a "tablet dance," in which corn is carried in the hands, and takes place just before the harvest. The dance continues for a whole day and night in the open plaza, and most of the ceremonials can be seen by all.<sup>1</sup>

Not far from the site of an old Pueblo of the Zuñi valley, called Halonawan, the "Ant Hill," on the opposite side of the Rio Zuñi from Shewena, the present Pueblo of Zuñi, there is a small shrine known as Herpätenäh. This is a very sacred place to the Zuñians, and very interesting ceremonies are performed about it. At the close of the *Hamponey* a solemn procession of participants in the ceremonies of the dance makes a pilgrimage to it. They place in its interior the offerings of prayer plumes, sacred meal and water used in the dance. While I have reserved a description of what takes place at Herpätenäh for another place, a notice of it finds an appropriate place here in connection with my phonographic work on the songs and prayers of the *Hamponey*.

Travellers on the Atlantic and Pacific Railroad may have noticed the splendid flow of lava or "*malpais*" near the road at McCarty and Grant Stations. The appearance of this lava is so fresh that one might say that it was viscid but a few years ago. In places it looks not less ancient than some of the historic lava flows on the sides of Vesuvius. It is reported on good evidence that at certain points along the edge of this flow there are artificial structures, partially covered by this lava. The existence of these would be good evidences of its age as compared with the existence of man in the neighborhood. As additional evidence bearing on this point I have brought to light an old Acoma folk-tale which accounts for its origin. I owe my knowledge of the existence of this tale to Capt. Pradt, of Laguna.

According to this legend an old gambler challenged the sun to play with him. This challenge the sun at first refused to accept, but being taunted with cowardice he played with his challenger, won all that he had, and made him blind. The blind man was in turn taunted by his fellows, and to revenge himself sought the help of a powerful person, who caused the earth-pitch (lava) to rise out of the earth and destroy men and their dwellings. The whole human race, the story goes, would have been destroyed if the snow-birds had not collected together

<sup>1</sup> Mexicans are not allowed to witness any of the sacred dances of the Zuñians.

to aid it, and brought with them<sup>2</sup> the snow which cooled off the liquid lava, and hardened it into stone.

Although summer months are not the best in which to obtain folk-tales from the Zúñians, and from some, if not all, of the other Pueblo Indians, I was fortunate enough to get on the phonograph the story of the origin of the lava flow from a Laguna Indian in his own words. Outside of its value as an account of the origin of this stream of lava, it is also interesting as a record—I believe the first on a phonograph—of a specimen of the Queres language, which is spoken by more Pueblo Indians than any of the several linguistic branches characteristic of the sedentary Indians of New Mexico.

Not the least important of the phonographic records which were taken are several prayers used by hunters to their fetishes, and that of a member of the Pitslashewāne, or “Priests of the Bow,” used formerly in the wars with their foes, the Navajos. All of these, which form an interesting collection, are reputed to be very old. As their use is undoubtedly dying out, as game decreases and probabilities of war diminish, a permanent phonographic record of these, most of which have been faithfully recorded by phonetic methods, and translated by Cushing in his most interesting paper on Zúñi Fetishes, is an important addition to my collection.

In my previous paper I have stated that I was able to obtain a phonographic record of the Kaklan, or so-called Zúñi epic, a ritual which narrates the history of the Zúñi race. This important and valuable unwritten record of the past of the nation *I was not able to obtain*. When my former paper was written I thought I had obtained it, but I have since detected my error. After the paper was written, when I found that I had been mistaken, I tried in every way to get this ritual in the language of the priest who recites it, but always to be put off with other things, and at last to be refused. There is certainly no more valuable acquisition to be made in a linguistic study of the Zúñi language than to persuade the Indians to entrust this account of their history to the phonograph, but I must confess my failure as yet to bring it about.

The almost illimitable field for research on the languages of our aborigines which presents itself to the student demands more workers. Now is the time to collect material before all is lost. The phonetic

<sup>2</sup> In Pueblo conceptions the frog brings the rain, the butterfly the summer, and the snow-bird the snow. Causes and effects are singularly confounded, and innumerable instances where animals cause atmospheric and climatic conditions in the same way that the snow-birds brought the cold might be mentioned.

methods now in use are good, but phonograph records are easier to make and more satisfactory. While the collection of many cylinders on which the language, songs, and similar records are made is only a means to an end, it is a practical and efficient way for immediate preservation. The scientific study of these records comes later, but now is the time for collection of them. Edison has given us an instrument by which our fast-fading aboriginal languages can be rescued from oblivion, and it seems to me that posterity will thank us if we use it to hand down to future students of Indian languages this additional help in their researches.—J. WALTER FEWKES, *Boston, October 4, 1890.*

**The Aryan Cradle-Land.**—"It will be for the benefit of our science," said the president of the Anthropological Section of the British Association, "that speculations as to the origin and home of the Aryan family should be rife; but it will still more conduce to our eventual knowledge of this most interesting question if it be consistently borne in mind that they are but speculations." With the latter, no less than the former, opinion I cordially agree. And as in my address on the Aryan cradle-land, in the Anthropological Section, I stated a greater variety of grounds in support of the hypothesis of origin in the Russian steppes than has been elsewhere set forth, I trust that I may be allowed briefly to formulate these reasons, and submit them to discussion.

(1) The Aryans, on our first historical knowledge of them, are in two widely-separated centers,—Transoxiana and Thrace. To Transoxiana as a secondary center of dispersion the Eastern Aryans, and to Thrace as a secondary center of dispersion the Western Aryans, can with more or less clear evidence, or probable inference, be traced from about the fourteenth or perhaps the fifteenth century B.C.; and the mid-region northwest of Transoxiana and northeast of Thrace—and which may be more definitely described as lying between the Caspian and the Euxine, the Ural and the Dnieper, and extending from the forty-fifth to the fiftieth parallel of latitude—suggests itself as a probably primary centre of origin and dispersion.

(2) For the second set of facts to be considered reveal earlier white races from which, if the Aryans originated in this region, they might naturally have descended as a hybrid variety. Such are the facts which connect the Finns of the north, the Khirgiz and Turkomans of the east, and the Alarodians of the south, with that non-Semitic and non-Aryan white stock which have been called by some Allophyllian, but which, borrowing a term recently introduced into geology, may, I



think, be preferably termed Archean ; and the facts which make it probable that these white races have from time immemorial met and mingled in the South Russian steppes. Nor, in this connection, must the facts be neglected which make great environmental changes probable in this region at a period possibly synchronous with that of Aryan origins.

(3) In the physical conditions of the steppes characterizing the region above defined there were, and indeed are to this day, as has been especially shown by Dr. Schrader, the conditions necessary for such pastoral tribes as their language shows that the Aryans primitively were ; while in the regions between the Dnieper and the Carpathians, and between the Oxus and the Himalayas, the Aryans would, both in their southwestern and southeastern migrations, be at once compelled and invited by the physical conditions encountered to pass at least partially from the pastoral into the agricultural stage.

(4) The Aryan languages present such indications of hybridity as would correspond with such racial intermixture as that supposed ; and in the contemporary language of the Finnic groups Prof. de Lacouperie thinks that we may detect survivals of a former language presenting affinities with the general characteristics of Aryan speech.

(5) A fifth set of verifying facts are such links of relationship between the various Aryan languages as geographically spoken in historical times ; such links of relationship as appear to postulate a common speech in that very area above indicated, and where an ancient Aryan language still survives along with primitive customs. For such a common speech would have one class of differentiations on the Asiatic and another on the European side, caused by the diverse linguistic reactions of conquered non-Aryan tribes on primitive Aryan speech, or the dialects of it already developed in those great river-partitioned plains.

(6) A further set of verifying facts is to be found in those which lead us more and more to a theory of the derivative origin of the classic civilizations, both of the Western and of the Eastern Aryans. Just as between the Dnieper and the Carpathians, and between the Oxus and the Himalayas, there were such conditions as must have both compelled and invited to pass from the pastoral into a partially agricultural stage, so, in passing southward from each of these regions, the Aryans would come into contact with conditions at once compelling and inviting to pass into a yet higher stage of civilization. And in support of this all the facts may be adduced which are more and more compelling scholars to acknowledge that in pre-existing Oriental civilizations the sources are to be found, not only of the

Hellenic and the Italic, but of the Iranian and the Indian civilizations.

(7) Finally, if the Hellenic civilization and mythology is thus to be mainly derived from a pre-existing Oriental or "Pelasgian" civilization, it is either from such pre-existing civilizations, or from Aryans such as the Kelto-Italians, migrating northward and southward from Pelasgian Thrace, that the civilization of Western and Northern Europe would; on this hypothesis, be traced; and a vast number of facts appear to make it more probable that the earlier civilization of Northern Europe was derived from the south than that the earlier civilization of Southern Europe was derived from the north.

The three conditions of a true solution of the problem either of Semitic or of Aryan origins appear to be these: First, the locality must be one in which such a new race could have ethnologically, and secondly philologically, arisen as a variety of the Archean stock of white races; and thirdly, it must be such as to make easily possible the historical facts of dispersion and early civilization. And I venture to submit the above set of facts as not inadequately, perhaps, supporting the South Russian "speculation as to the origin and home of the Aryan family."—J. S. STUART GLENNIE, in *Nature*, October 2d, 1890.

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### MICROSCOPY.<sup>1</sup>

**Lumbricus, Egg-Laying, etc.**<sup>2</sup>—In spite of many individual variations, the egg-capsules of the various species of *Lumbricus* are, as a rule, readily distinguishable in form, color, and size. Those of *L. fetidus*, which are laid in and about manure-heaps, are rather regularly fusiform, varying in color from light yellowish to dark brownish olive; they measure on the average about 4-6 by 2-3 millimeters. The albumen is tough and jelly-like, dissolves with difficulty in water, and becomes of a horn-like consistency after the hardening action of reagents. Each capsule contains from ten to sixty ova, of which not more than ten or twelve undergo development, and this number may be reduced to one or two, particularly in the winter season. The capsules of *L. communis* and *L. terrestris* are

<sup>1</sup> Edited by C. O. Whitman, Clark University, Worcester, Mass.

<sup>2</sup> E. B. Wilson. *Journ. Morphology*, III., 3, Dec. 1889.